



Natural Laboratory

Lesson Plan for Grades 6-8

Focus Question

Why are members of the Hawaiian honeycreeper family so diverse?

Lesson at a Glance

Students will compare five members of the honeycreeper family and propose what environmental factors might have affected their evolution.

Key Concepts

Evolution on remote islands occurs as it does on continents but more rapidly and with more observable results. The evolution of honeycreepers in Hawai'i is a classic example of this.

Objectives

Students will demonstrate which physical features of a particular honeycreeper evolved as a result of habitat factors.

Standards/Subject Areas

Science (Interdependence, Evolution)

Time

Two class periods

Materials

- *Maoli Nō* DVD
- DVD player and monitor
- Pictures of ancestral finch species by H. Douglas Pratt &/or p. 6-69, 70 from 'Ōhi'a Project Grades 4-6 (4-5 copies of each)
- Photographs of 'i'iwi, palila, 'ākohekohe, 'amakihi, 'apapane
- Other resources on native plants and birds
- Writing/Presentation materials

Teacher Background

Hawaii's Birds by Hawaii Audubon Society, page two

'Ōhi'a Project Grade 6, p. 65

'Ōhi'a Project Grades 7-8, p. 90, 94, 111

The plants and animals that colonized the Hawaiian Islands adapted to numerous ecological conditions. A variety of microclimates were created as a result of the combination of stable climate, varied topography and elevation. These microclimates - rainforest, dryland forests, mesic forests and alpine deserts - offered a number of habitats to colonizing species.

The diverse habitats in close proximity and in the isolation of oceanic islands provided conditions for more rapid evolution than would occur on continents. This provided ideal conditions for adaptive radiations - "the extensive development of new species from a single common ancestor" ('Ōhi'a Project, Grades 7&8, p.90).

In the bird world, an entire sub-family, the Hawaiian honeycreepers, has evolved in the Hawaiian Islands. These endemic birds have speciated to be anatomically unique enabling the spectrum of species to take advantage of a variety of food resources - nectar, insects, seeds and even mollusks.

Procedure

1. Divide students into small groups.
2. Handout copies of ancestral finch species and of contemporary native birds to each group. Provide access to resource books.
3. Introduce 'I'iwi Pōlena song from *Maoli Nō* DVD, which shows good footage of 'I'iwi and Lobelia plant.
4. Play 'I'iwi Pōlena song from DVD and Interlude #7 -- Natural Laboratory.

"Remote oceanic island archipelagos like Hawai'i are prized as unparalleled natural laboratories for the study of evolution. While species that colonize such island groups evolve in the same way as continental species, the process occurs much faster in an island setting and is more readily observable. Many of the phenomena that Darwin documented in the fabled Galapagos Islands (another isolated island group that inspired his theory of evolution) find even greater expression in Hawaii's native forests."

5. Have students work independently to create a diagram/poster depicting the habitat factors (e.g., rainfall, forest type) contributing to a particular native bird species' characteristics.

Extended Activities

"Create a Creature" where students are given habitat factors and they come up with a new creature.

"Hawaiian Honeycreeper Cousins" - 'Ōhi'a Project Grade 6, p. 65-70

